



THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Appln. of: KNEISEL, Lawrence L., et al.

Appln. No.: 10/624,040

Filed: July 21, 2003

For: LIGHT WEIGHT PORTABLE
PHASED ARRAY ANTENNA

Attorney Docket No: 10541-1800

Examiner: Unknown

Art Unit: 3662

PRELIMINARY AMENDMENT

Please amend the above-referenced patent application, which was filed on July 21, 2003. Applicants respectfully submit this paper comprising the following parts:

- I. Amendment to the Cover Sheet, beginning on page 2;
- II. Amendments to the Specification, beginning on page 3;
- III. Amendments to the Claims, beginning on page 5;
- IV. Remarks, beginning on page 10.

Applicants note that the Transmittal to which this paper is attached includes a Certificate of Mailing under 37 C.F.R. §1.8; and a fee statement calculating any fee(s) presently due in connection with the filing of this paper, along with an authorization to charge any fee deficiency to the deposit account of Applicants' assignee, Visteon Global Technologies, Inc., Deposit Account No. 06-1500.



COPY**I. Amendments to the Cover Sheet**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
APPLICATION FOR UNITED STATES LETTERS PATENT

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TITLE: LIGHT WEIGHT PORTABLE
PHASED ARRAY ANTENNA

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COPY**II. Amendments to the Specification**

1. Please replace prior paragraph [0017] with the following new paragraph:

[0017] Each of the plurality of antenna nodes 30 communicates through one of the LCC subplates 50a through 50d with a central processor or electronic control unit 60 that combines the incoming signals, calculates deviations among the signals due to differences in the location and direction of the antenna nodes, and sends control signals back to the antenna nodes 30 allowing the plate 46 supporting the phased array 40 to be re-directed or re-pointed that allow the timing or delay of some or all of the antenna nodes 30 to be adjusted relative to the others to obtain a synchronized condition among the antenna nodes 30, thus allowing them to process signals in which the phase is synchronized. Use of light channel technology to form the substrate subplates 50a through 50d makes the preferred embodiment of the inventive antenna system 10 light weight and portable.

2. Please replace prior paragraph [0021] with the following new paragraph:

[0021] Referring now to FIG. 5 and FIG 6, each of the antenna nodes 30 communicates with the main electronic control unit 60 through the optically transparent plate 46. Power is supplied by means of conductive traces or conductors 70 that are routed from each of the antenna nodes 30 to an interconnect pad 71. Each of the interconnect

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pads 71 is connected to a duplicate interconnect pad 72 on the under side of the LCC subplate 50a through 50d by means of a copper plated through hole 73. The duplicate interconnect pads 72 are in turn each connected to one of a plurality of conductor pads 80 embedded in the housing of the electronic control unit 60 using any one of the many known methods of interconnection, such as by way of example, connectors or press fit pins, thereby completing a communications path from each of the antenna nodes 30 to the electronic control unit 60 that processes the signal data. The electronic control unit 60 is located and secured to the collapsible support stand 20 through means of a central locator pin 94 that mates with a central alignment hole 95 in the housing of the electronic control unit 60.

3. Please replace prior paragraph [0022] with the following new paragraph:

[0022] Also shown in FIG 5 is an emitter/transmitter LED 90 that transmits signals from the electronic control unit 60 to the plurality of antenna nodes 30 that form the phased array 40. Conversely, photoreceptors or other receiver devices LEDs 91 receive signals from the plurality of antenna nodes 30 in the phased array 40 and convey these signals to the electronic control unit 60.

4. Please replace prior paragraph [0024] with the following new paragraph:

[0024] Referring now to FIG. 7, each of the receiving node electronics 100 consists of a dipole element 110 attached to a low noise amplifier 120, which in turn feeds a programmable phase delay element 130. The

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output of the phase delay element 130 modules the output of a light emitting or laser diode 140 that is coupled to the LCC material of the subplate 50. The light is gathered and combined at the receiver LEDs ~~or diodes~~devices 91, which couple the signal to detector/demodulation circuits within the electronic control unit 60. The electronic control unit 60 processes the signal to produce the resultant broadband signal.

5. Please replace prior paragraph [0025] with the following new paragraph:

[0025] A local processor 170 within the receiving node electronics 100 receives signals from the electronics control unit 60 via a pin 160 within the receiving node electronics 100. The local processor 170 calculates the appropriate delays for the dipole element 110 and modulates an LED/transceiver to send that information back to the appropriate antenna nodes 30 in the phased array 40 in order to "point" adjust the delay of each of the antenna nodes 30 as needed to achieve synchronization of the phased array 40. The adjustment in the angle of the phased array 40 delay of the antenna nodes 30 is controlled by microprocessor controlled phase delay lines contained in the electronic control unit 60. Alternatively, the means to control of the angle of the phased array 40 could be contained in or affixed to the collapsible support stand 20.

III. Amendments to the Claims

1. (Original) An apparatus for receiving communication signals from satellites, comprising:



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a plate of light channel material, the plate having a top surface and a bottom surface;

a plurality of antenna nodes supported on the top surface of the plate;

a support stand detachably attached to the bottom surface of the plate;

wherein the plate, the plurality of antenna nodes, and the support stand interconnect to form a lightweight portable antenna assembly.

2. (Original) The apparatus of claim 1, wherein the support stand further comprises an electronic control unit detachably attached to the bottom side of the plate.

3. (Original) The apparatus of claim 1, wherein at least one of the antenna nodes in the plurality of antenna nodes communicates through the plate of light channel material with the electronic control unit.

4. (Original) The apparatus of claim 1, wherein each of the antenna nodes in the plurality of antenna nodes is located in a known position on the plate.

5. (Original) The apparatus of claim 1, wherein at least two of the antenna nodes in the plurality of antenna nodes is a dipole antenna element, the plurality of antenna nodes collectively forming a phased array for transmitting and receiving signals.

6. (Original) The apparatus of claim 2, wherein the plate is formed from a plurality of subplates formed of light channel material.

7. (Original) The apparatus of claim 1, wherein the support stand is collapsible.



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8. (Currently Amended) The apparatus of claim 2, wherein the electronic control unit combines the signals from each of at least two of the antenna nodes and calculates a deviations between the signals in location and direction to produce a control signal that allows the plate to be positioned delay of at least one of the antenna nodes to be adjusted.
9. (Original) The apparatus of claim 1, wherein the light channel material is a material that is capable of conveying communication signals in the form of light.
10. (Original) The apparatus of claim 1, wherein the light channel material is a polycarbonate material.
11. (Original) The apparatus of claim 1, further comprising at least one conductor supported by the plate, said conductor providing a power transmission pathway.
12. (Original) The apparatus of claim 5, further comprising an alignment feature connected to each of the plurality of subplates, the alignment feature providing means to align the subplate with the electronic control unit.
13. (Original) The apparatus of claim 10, further comprising an interconnection pad, wherein the conductor is routed from the antenna node to the interconnect pad.
14. (Original) An apparatus for receiving communication signals from satellites, comprising:

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a plate of light channel material, the plate having a top surface and a bottom surface;

a plurality of antenna nodes supported on the top surface of the plate;

a support stand detachably fixed to the bottom surface of the plate;

an electronic control unit, at least one of the antenna nodes in the plurality of antenna nodes communicating through the plate of light channel material with the electronic control unit;

wherein the plate, the plurality of antenna nodes, the electronic control unit, and the support stand interconnect to form a lightweight portable antenna assembly that is easily disassembled.

15. (Original) An apparatus for receiving communication signals from satellites, comprising:

a plate of light channel material formed from a plurality of aligned subplates, each of the subplates having a top surface and a bottom surface;

a plurality of antenna nodes supported on the top surface of each of the subplates;

an electronic control unit contained in a housing that has a bottom surface, at least one of the antenna nodes in the plurality of antenna nodes communicating through the plate of light channel material with the electronic control unit;



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a collapsible support stand detachably fixed to the bottom surface of the housing;

wherein the plate with the plurality of antenna nodes, the electronic control unit, and the support stand interconnect to form a lightweight antenna assembly that may be disassembled into easily portable components.

16. (New) The apparatus of claim 1, wherein the light channel material is a glycolized polyester material.
17. (New) The apparatus of claim 1, wherein the light channel material is an acrylic material.



IV. Remarks**COPY**

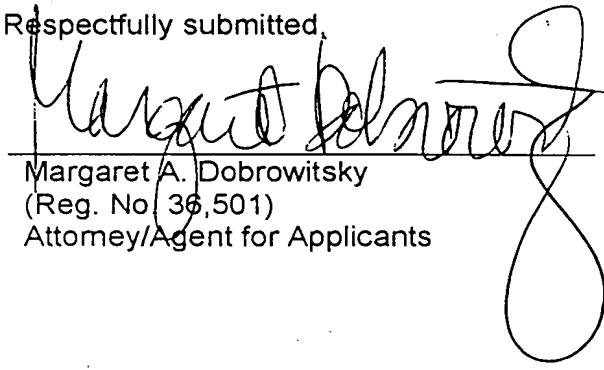
Claims 1-15 are pending in the application. Claim 8 has been amended in this preliminary amendment. Claims 16 and 17 have been added by this preliminary amendment. Accordingly, after entering this preliminary amendment, claims 1-17 would be pending. The claim amendments presented above are being submitted by Applicants for the purpose of pointing out and more particularly claiming that which Applicants believe to be their invention.

Upon entry of the present amendment, Applicants respectfully submit that the no new matter has been added. Applicants respectfully request entry of the preliminary amendment.

7-7-2004

Date

Respectfully submitted,


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